

REMARKS

In the Office Action mailed August 15, 2006, the Examiner re-opened prosecution of this application following the filing of a second appeal brief and rejected claims 9-13 under 35 U.S.C. §103(a) as unpatentable over Aoki et al. (U.S. Patent No. 4,903,114) in view of Gainey et al. (U.S. Patent No. 6,313,519) and Tanaka, U.S. Patent No. 6,265,762.

Claims 1-8 and 20-27 had previously been cancelled.

Claim 9 is directed to a semiconductor package comprising an intermediate lead finger mounting substrate; a semiconductor die and an intermediate lead finger mounted on a first surface of the intermediate lead finger mounting substrate; a package lead; a bond wire having a first end coupled to the package lead, a second end coupled to a bond pad on the die and an intermediate portion attached to the intermediate lead finger mounting substrate; a heat sink coupled to a second surface of the intermediate lead finger mounting substrate; and a mold compound that encloses the die, a portion of the package lead, the bond wire, the intermediate lead finger and the heat sink.

In rejecting claim 9, the Examiner acknowledged that his primary reference, Aoki et al., does not disclose the use of a single bond wire running from the die to the package lead but relies on Gainey for such teaching. He also acknowledged that both Aoki and Gainey fail to teach a heat sink coupled to the second surface of an intermediate lead finger mounting substrate and the use of a mold compound but asserts that Fig. 9 of Tanaka provides such teaching.

Applicant respectfully submits that Tanaka does not suggest a structure that can be combined with that of Aoki and Gainey.

To establish a prima facie case of obviousness, three basic criteria must be met:

1) there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;

2) there must be a reasonable expectation of success; and

3) the prior art reference must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

As shown in Figs. 8 and 9 of Tanaka, a bonding wire 13 extends upward from a pad electrode 11 on a semiconductor chip 10, is bent downwards approximately 120°, appears to

touch a corner of supporting portion 15, and ends at lead 4. At Col. 10, lines 33-35, the description of Fig. 8 states that the bonding wire is “bonded between the pad electrodes of the semiconductor chip and respective leads,” conspicuously omitting any mention of any connection to the supporting portion 15.

A similar structure is shown in Figs. 10 and 11 of Tanaka. The difference between the variation of Figs. 10 and 11 and the embodiment of Figs. 8 and 9 lies in the mounting of supporting portion 15 and a jig 16 in the variation of Figs. 10 and 11. In the variation, the supporting portions 15 project through slits 17 in supporting body 8; and, as stated at Col. 10, lines 60-61 the supporting portions are retracted from the slits after wire bonding is completed. Since the supporting portions are retracted from the slits after wire bonding is completed, it is apparent that the bonding wires are not affixed or bonded in any way to the supporting portions. Otherwise, the binding wires would be drawn through the slits, thereby destroying the electrical connection between the bonding pads and the leads.

From the foregoing, it is evident, as the Examiner concedes, that Tanaka et al. does not describe a semiconductor package in which the bonding wire is coupled or affixed to an intermediate lead finger.

In contrast, Aoki and Gainey disclose packages in which one or more bond wires are attached to an intermediate lead finger. Since Aoki and Gainey disclose structures in which bonding wires are attached to intermediate lead fingers while Tanaka discloses structures in which they are not, there is no teaching or suggestion that these references be combined. Indeed, Tanaka teaches the opposite of what is taught by Aoki and Gainey.

Since Aoki/Gainey do not suggest their combination with Tanaka, it is also evident that the Examiner has simply plucked from Tanaka a teaching that supporting body 8 may be made of a material having high thermal conductivity and combined this with Aoki and Gainey.

This, however, is an argument from hindsight. The Examiner has taken the elements of applicants’ claim 9, located them in the prior art and asserted that these elements can be combined even though there is no suggestion in the cited prior art for their combination. The Examiner’s schema of argument is expressly prohibited in numerous decisions of the Federal Circuit. For example, in Heidelberger Druckmaschinen AG v. Hantscho Commercial Products, Inc., 21 F. 3d 1068, 30 USPQ 2d 1344 (Fed. Cir. 1993), the Federal Circuit warned:

“When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination.” (emphasis supplied) 30 USPQ 2d at 1379.

Moreover, to prevent such hindsight arguments, the Federal Circuit has also required that there must not only be motivation to combine references but also motivation to combine the prior art teachings in the particular manner claimed:

“particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.” In re Kotzab, 217 F. 3d 1365, 1371, 55 U.S.P.Q. 2d 1313, 1317 (Fed. Cir. 2000).

The prosecution history of this application also confirms that this rejection is based on hindsight. Claims 9-13 were first rejected on June 12, 2002 as obvious over Lacap, U.S. Patent 5,905,299 in view of Tanaka. After a final rejection and submission of a appeal brief, that rejection was eventually withdrawn on August 23, 2004.

In the Office Action of August 23, 2004 claims 9-13 were rejected as obvious over Aoki et al., U.S. Patent 4,903,114, in view of Gainey et al., U.S. Patent 6,313,519 and Lacap, U.S. Patent 5,905,299. After another final rejection and the filing of another appeal brief, that rejection was eventually withdrawn by the present Office Action.

In the first set of rejections the Examiner argued that it was obvious to combine Tanaka and Lacap. In the second set of rejections, he argued that it was obvious to combine Aoki, Gainey and Lacap. Now, he argues that it is obvious to combine Aoki, Gainey and Tanaka.

Applicant respectfully disagrees. If it were obvious to make the present combination of references why wasn't such a combination made two years ago when the Examiner was well aware of the Aoki, Gainey and Tanaka references?

Because Aoki/Gainey do not suggest their combination with Tanaka, it is respectfully submitted that claim 9 is patentable over the cited references.

Dependent claims 10-13 are believed patentable for the same reason claim 9 is patentable.

For the foregoing reasons, applicants believe that all of the claims are now in condition for allowance and respectfully requests the Examiner to pass the subject application to issue. If for any reason the Examiner believes any of the claims are not in condition for

allowance, he is encouraged to phone the undersigned at (212) 309-6632 so that any remaining issues may be resolved.

Respectfully submitted,

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